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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Dennis M. Lettkeman et al.
Serial No.: 10/511,338
Conf. No.: 2174
Filed: 10/15/04
For: HIGH STRENGTH FLOORING
COMPOSITIONS
Art Unit: 1714
Examiner: Szekely, Peter A.

I hereby certify that this paper is being deposited with the United States Postal Service as FIRST-CLASS mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this date.

January 5, 2006

Date

Registration No. 30,778

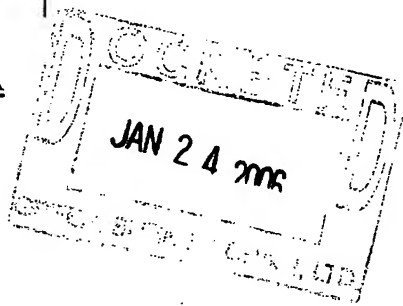
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Appr. February 20, 1998 Attorney for
Applicant(s)

Carla A. Mickelson

AMENDMENT A

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450



Dear Sir:

In response to the Office Action mailed October 5, 2005, please amend the application as follows:

Amendments to the Specification begin on page 2.

Amendments to the Claims begin on page 4.

Remarks begin on page 10.

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In the Specification:

Please replace the paragraph beginning on page 14, line 27, with the following rewritten paragraph:

When used as a topical underlayment, the composition is modified to be free flowing and easily pumped through a hose. Higher fluidity is desired without separation of the aggregate. In this application, water and the polymeric resin are used at the high end of their concentration range. The aggregate should be selected to reduce ~~separation of~~ separation or settling of the solids in the hose.

Please replace the paragraph beginning on page 15, line 22, with the following rewritten paragraph:

At the site where the floor or subfloor is to be laid, about 12 cc to about 40 cc of water is measured per 100 grams of the ingredients on a dry solids basis, and placed into a mixing vessel. If any wet or liquid ingredients are used, they are mixed into the water. The dry ingredients are then mixed into the water, forming a homogeneous slurry. The slurry is then applied, pumped, dumped or poured onto a substrate and allowed to set, forming the floor or subfloor.

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Please replace the paragraph beginning on page 20, line 2, with the following rewritten paragraph:

The dry components were dry blended and 1185 gram samples were measured.

Each sample was mixed with 2815 grams of sand, ~~than all~~ then all components were added to the water and blended. Results for slump tests, density and strength ~~are shown~~ are shown in Table II.

In the Claims:

Please amend claims 1, 9, 16 and 17 as follows.

1. (Currently Amended) A mixture to be employed in conjunction with water for preparing a slurry that hydrates to form a high strength flooring compound, comprising:

about 50% to about 98% by weight calcium sulfate hemihydrate, at least 25% of said calcium sulfate hemihydrate being the beta-calcined form;

about 0.2% to about 10% by weight of a polycarboxylate dispersant comprising oxyalkylene-alkyl ether and unsaturated dicarboxylic acid; and

0.05-50% by weight enhancing component.

2. (Original) The mixture of claim 1 wherein said calcium sulfate hemihydrate comprises at least 90% by weight of the beta-calcined form.

3. (Original) The mixture of claim 2 wherein said calcium sulfate hemihydrate consists essentially of the beta-calcined form.

4. (Original) The mixture of claim 2 wherein the concentration of said hemihydrate is from about 80% to about 95% by weight.

5. (Original) The mixture of claim 1 wherein said enhancing component comprises lime.

6. The mixture of claim 5 wherein the concentration of said lime in said mixture is from about 0.05% to about 10% by weight.

7. (Original) The mixture of claim 1 wherein said mixture comprises from about 0.2% to about 1% by weight polycarboxylate on a dry, aggregate-free basis.

8. (Original) The mixture of claim 1 further comprising polysaccharide.

9. (Currently Amended) A subfloor comprising a hydrated product of a pumpable slurry comprising:

about 50% to about 98% calcium sulfate hemihydrate, said hemihydrate comprising at least 25% of the beta-calcined form;

5 about 0.2% to about 10% of a polycarboxylate dispersant comprising
oxyalkylene-alkyl ether and unsaturated dicarboxylic acid;

 about 0.05% to about 50% enhancing component; and

 from about 12cc to about 40 cc water per 100 grams of a combined mixture of
the hemihydrate, the polycarboxylate and the enhancing component on a dry solids basis,
10 said hydrated mixture having a compressive strength in excess of 2500 psi (175 Kg/cm²).

10. (Original) The subfloor of claim 9 wherein said hemihydrate consists
essentially of beta-calcined hemihydrate.

11. (Original) The subfloor of claim 9 wherein the concentration of said
polycarboxylate dispersant is from about 0.2% to about 1% by weight on a dry, aggregate-
free basis.

12. (Original) The subfloor of claim 9 wherein said enhancing
component comprises lime.

13. (Original) The subfloor of claim 11 wherein said water is present in
an amount less than 35 cc water per 100 grams mixture on a dry, aggregate-free basis.

14. (Original) The subfloor of claim 13 wherein said water is present in an amount less than 25 cc per 100 grams of said mixture on a dry, aggregate-free basis.

15. (Original) The subfloor of claim 8 wherein said slurry further comprises polysaccharide.

16. (Currently Amended) A subfloor comprising a hydrated product of a pumpable slurry comprising:

about 50% to about 98% calcium sulfate hemihydrate;

about 0.2% to about 10% of a polycarboxylate dispersant comprising

5 oxyether-alkyl ether and dicarboxylic acids;

about 0.05% to about 50% enhancing component; and

from about 15cc to about 25 cc water per 100 grams of a combined mixture of the hemihydrate, the polycarboxylate and the enhancing component on a dry solids basis, said hydrated mixture having a compressive strength in excess of 2500 psi (175 Kg/cm²).

17. (Currently Amended) A method of preparing a subfloor comprising:

obtaining ingredients comprising from about 50% to about 98% calcium sulfate hemihydrate comprising at least 25% of the beta-calcined form, from about 0.2% to about 10% of a polycarboxylate dispersant comprising oxyalkylene-alkyl ether and unsaturated dicarboxylic acid and from about 0.05% to about 50% of an enhancing component, all on a dry solids basis;

separating the ingredients into wet ingredients and dry ingredients;

dry blending the dry ingredients;

measuring from about 12 cc to about 40 cc of water per 100 grams of the ingredients on a dry solids basis;

forming a mixture of the wet ingredients and the water;

forming a slurry from the dry ingredients and the mixture;

pouring the slurry in an area prepared for the subfloor; and,

allowing the slurry to set, forming the subfloor having a compressive strength in excess of 2500 psi.

18. (Original) The method of claim 17 wherein the calcined gypsum comprises beta-calcined gypsum.

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19. (Original) The method of claim 17 wherein said calcium sulfate hemihydrate comprises at least 80% by weight of the dry mixture on an aggregate-free basis.

20. (Original) The method of claim 17 further comprising the step of mixing an aggregate into the dry ingredients prior to forming the slurry.

21. (Original) The method of claim 17 further comprising packaging the dry mixture after said dry blending step.

22. (Original) A subfloor comprising the hydrated product of the process of claim 16.

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REMARKS

Reconsideration of this application is respectfully requested. Applicants believe that consideration of this amendment is proper because they have attempted to comply with every requirement expressly set forth in the previous Office Action dated October 5, 2005 and believe the application is now in condition for allowance.

Claims 1-8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Lowe et al. in U.S. Patent No. 4,067,939. The Examiner states that Lowe et al. ("Lowe") disclose calcined gypsum and Portland cement, gum Arabic and acrylic resin emulsion. Applicants respectfully traverse this rejection.

In order to be anticipatory, a reference must disclose each and every feature of the claim. Lowe discloses the use of an acrylic resin to resist weathering and to make the composition more water resistant. However, applicants' claims require the addition of a polycarboxylate dispersant. The acrylic resin suggested by Lowe is clearly not a dispersant. In column 6, lines 32-45, the addition of an acrylic resin or a wax for improved weather resistance is discussed. At the end of the paragraph, Lowe states that the wax increases the fluidity of the mix and that it can replace all or a portion of the Melment or Gum Arabic. It is clear that the wax is disclosed to have dispersant properties, but not the acrylic resin. Melment and Gum Arabic are the disclosed dispersants. Thus, these references fail to disclose any polycarboxylate dispersant.

Further, Lowe's use of an acrylic resin does not teach the additional features of Applicants' amended claims. The polyacrylate dispersant of claim 1 now features

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oxyalkylene-alkyl ethers and unsaturated dicarboxylic acid in its structure. None of these monomers is taught in the Lowe reference as part of the polycarboxylate. Since the use of a polycarboxylate dispersant having oxyalkylene-alkyl ethers and unsaturated dicarboxylic acid is not taught in the reference, claims 1-8 cannot be anticipated. Applicants have traversed the rejection and request that it be withdrawn.

Lowe further fails to reveal several features of the dependant claims. Claims 5 and 6 feature the addition of lime to the composition. There is no teaching or suggestion in Lowe of adding lime to the disclosed composition. Thus, these claims are not anticipated by the Lowe reference.

Claims 1-8 are further rejected under 35 U.S.C. § 102(b) as being anticipated by Saito et al. in U.S. Patent No. 4,341,560 ("Saito"). Applicants respectfully traverse the rejection.

The Examiner states that Saito teaches the use of beta hemihydrate gypsum in column 1 of the application. Beta hemihydrate is mentioned only in a discussion of Japanese Patent Publication No. 1224/78. In that reference, use of beta hemihydrate is revealed only in combination with an alkylsilicate compound in a gypsum slurry. Thus, there is no suggestion of combining beta hemihydrate with any features of the Saito reference. Even if the mention of beta hemihydrate in col. 1 referred to the Saito invention, it does not reveal the criticality of having at least 25% of the gypsum be the beta hemihydrate form.

Further, Saito fails to suggest the use of a polycarboxylate dispersant having oxyalkylene-alkyl ether and unsaturated dicarboxylic acid as required in the amended claims.

Saito discloses only the use of poly(α , β -unsaturated carboxylic acid ester) emulsion combined with gypsum and an aqueous solution of alkaline metal alkylsiliconate or phenylsiliconates. Col. 2 states that the poly(α , β -unsaturated carboxylic acid ester) is selected to impart weathering stability, water resistance, alkaline resistance and water repellency to the gypsum, but there is no suggestion that it provides dispersant properties. Since this reference fails to disclose at least two features of claims 1-8, Applicants have traversed the rejection and request that the rejection be withdrawn.

Claims 1-8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Nitto Chem. Ind. Co. in JP-59-025876 ("Nitto"). The abstract discloses a mixture of lime with a gypsum "selected from gypsum dihydrate, α -hemihydrate gypsum, β -hemihydrate gypsum and IItype (sic) anhydrous gypsum at (1:3 – 3:1) weight ratio[.]" Use of 0.25 to 5 wt % of a dispersing agent is also revealed. Sodium lignin sulfonate is the only dispersing agent disclosed in the abstract.

This reference does not teach or suggest the use of a polycarboxylate dispersing agent, nor does it specifically disclose a polycarboxylate having oxyalkylene-alkyl ethers and unsaturated dicarboxylic acid as required in the amended claims. Use of a polycarboxylate dispersant is important when preparing a composition to be used as a

flooring composition. Flooring compositions are very fluid for ease in leveling or to be self-leveling. This is particularly difficult when β -hemihydrate gypsum is used in the gypsum composition. Due to the crystal morphology, the β -hemihydrate particle is more difficult to fluidize than that of the α -hemihydrate particle. Flooring compositions have traditionally used α -hemihydrate for this reason. The dispersant used by Applicants allows the use of high concentrations of β -hemihydrate in a gypsum subfloor. Since the reference does not specifically disclose the particular dispersant required by Applicants' claims, Applicants have traversed the anticipation rejection and request that it be withdrawn.

Claims 1-14 and 16-22 are rejected under 35 U.S.C. § 102(b) as being anticipated by Stewart et al in U.S. Patent No. 5,424,099 ("Stewart"). Applicants' respectfully traverse this rejection. The reference does not disclose every feature of Applicants' claimed invention.

The Examiner states that Stewart divulges beta-calcined gypsum in Table 1. This is correct, but beta-hemihydrate is disclosed only in the context of a comparative example. In this example, the only superplasticizer used is naphthalene sulfonate. There is no teaching or suggestion that beta-calcined gypsum is useful in Stewart's invention. Col. 3 and the claims disclose specifically that alpha hemihydrate is used. The use of polycarboxylate dispersants in general is also discussed in Col. 3, but it is discussed only in combination with alpha hemihydrate. Further, the dispersant does not include having

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oxyalkylene-alkyl ethers and unsaturated dicarboxylic acid as featured in the amended claims. Thus, there is no disclosure of using beta-hemihydrate with a polycarboxylate dispersant and there is no suggestion that Applicants' specific dispersant would be useful. Since Stewart fails to anticipate Applicants' claims, withdrawal of the rejection is respectfully requested.

Further, Stewart fails to disclose several of the additional features of the remaining claims. At least claims 5, 6 and 12 reveal the addition of lime as the enhancing component. The addition of polysaccharide is featured in at least claims 8 and 15. Claims 13, 14, 16 and 22 utilize amounts of water, less than 40cc water per gram of dry mixture, that is less than the amount of water taught by Stewart in column 5, lines 19-21. None of these features are disclosed in the Stewart reference. Thus, even if the features of independent claims 1 and 9 are met, Stewart does not anticipate features of at least these claims.

Claims 1-14 and 16-22 are further rejected under 35 U.S.C. § 102(b) as being anticipated by Inoue in JP-60-171260. A full translation of this reference was obtained, and is included with the Supplemental Information Disclosure Sheet enclosed herewith. Inoue reveals an inorganic hydraulic composition comprising 10-90 parts of a hydraulic cement, 10-90 parts of a hydraulic gypsum, 17-25 parts of water, 2-16 parts of a water-dispersing organic polymer and 0.5-2 parts of a moisture-reducing agent. This reference fails to

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disclose every feature of Applicants' claims, and therefore, does not anticipate the instant invention.

At least, the Inoue reference fails to disclose a polycarboxylate dispersant that includes oxyalkylene-alkyl ether and unsaturated dicarboxylic acid as required in the amended claims. Organic polymers are discussed in the reference, specifically vinyl acetate, an acryl, a chlorine-containing vinyl polymer and a compound rubber. Copolymers of an acrylate ester and a methacrylate ester are especially preferred. The reference includes no discussion of oxyalkylene-alkyl ethers or dicarboxylic acids as featured in Applicants' amended claims. Since this reference fails to disclose at least one feature of Applicants' claims, it does not anticipate the present invention.

All claims in this application were commonly owned at the time the inventions were made. An executed Assignment to United States Gypsum Co. was filed as evidence of same. The assignment was recorded October 15, 2004 on Reel 016803, Frame 0432.

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stewart or Inoue in view of Lowe, Saito or Nitto. The Examiner avers that it would be obvious to combine the lime of Saito or Nitto to the composition of the primary references in order to improve the mechanical strength and to replace the superplasticizer with Gum Arabic since it is a cheap functional equivalent. Applicants traverse this rejection because the Examiner has failed to establish a *prima facie* case of obviousness.

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To establish a *prima facie* case of obviousness, three basic criteria must be met.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Second, there must be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). Finally, to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Obviousness has not been established because there is no likelihood of success in combining the references and, even if the references were combined, they would not reveal each and every feature of Applicants amended claims. Only one reference, Stewart, discloses the use of a polycarboxylate dispersant. However, this reference teaches that only alpha hemihydrate is used. The teachings of Stewart would have to be disregarded to combine it with another reference teaching the use of beta hemihydrate. This would not render Applicants' claims obvious because there would be little likelihood of success in the combination given Stewart's requirement for alpha hemihydrate. Further, none of the references reveal the use of a polycarboxylate dispersant having oxyalkylene-alkyl ethers and unsaturated dicarboxylic acid. Thus, no *prima facie* case of obviousness has been established.

Furthermore, none of the cited prior art references considered the problem faced and solved by the present inventor, that of formulating a highly fluid flooring composition that includes β -hemihydrate gypsum. Of the references, Stewart considers making a self-leveling flooring composition, and solves it by limiting the gypsum source to α -hemihydrate gypsum. Inoue also makes a self-leveling flooring composition, but does so by combining multiple moisture-reducing agents. None of the remaining references address this problem since they are directed to gypsum slurries for other purposes, such as making

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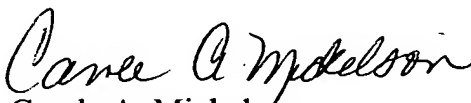
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cast articles or grouting. The problem considered by the inventor must be considered in making a determination as to the obviousness of combining references.

By the above arguments and amendments, Applicants believe that they have complied with all requirements expressly set forth in the pending Office Action. Issuance of a Notice of Allowance on all claims is respectfully requested. Should the Examiner discover there are remaining issues which may be resolved by a telephone interview, he is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By: 
Carole A. Mickelson
Registration No. 30,778

January 5, 2006
300 South Wacker Drive, Suite 2500
Chicago, Illinois 60606
(312) 360-0080
Customer No. 24978